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(54) **MOTORCYCLE CONVERSION ASSEMBLY**

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(51) **Int. Cl.**

**B62D 61/12** (2006.01)  
**B62K 13/00** (2006.01)  
**B62H 7/00** (2006.01)

(52) **U.S. Cl.** ..... **180/209; 180/311; 280/124.128; 280/124.166; 280/293; 280/781**

(58) **Field of Classification Search** ..... **180/209, 180/210, 311; 280/124.128, 124.166, 204, 280/293, 781**

See application file for complete search history.

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*Primary Examiner* — Paul N Dickson

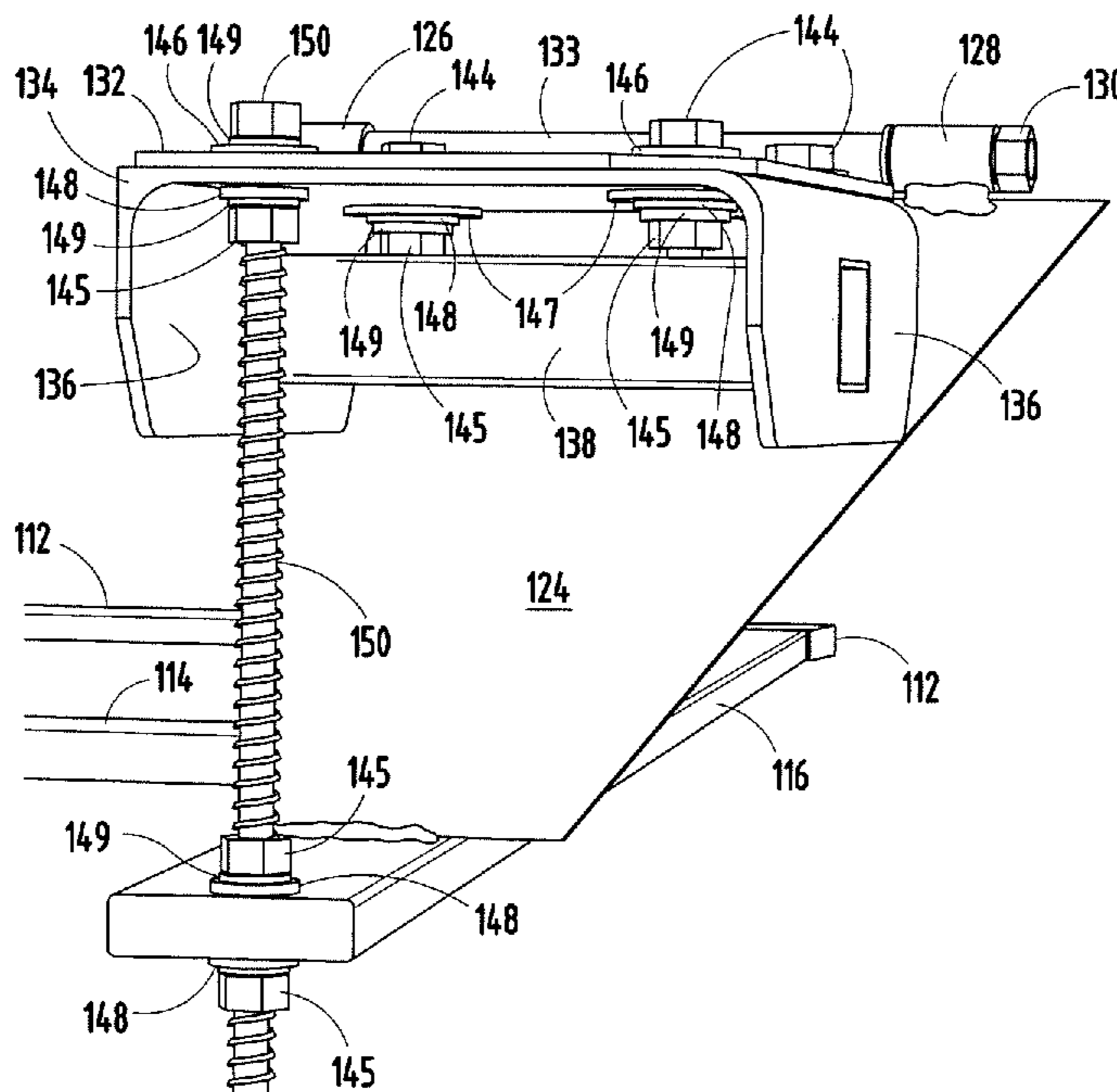
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(57) **ABSTRACT**

A motorcycle conversion assembly for a motorcycle comprising first and second side members and first and second cross members to thereby define a rigid frame. The motorcycle conversion assembly further comprises first and second frame plates operably coupled to the frame and first and second axle plates operably coupled and rotatably adjustable relative to the first and second frame plates. The motorcycle conversion assembly further comprises first and second torsion adjustment assemblies, which are used to adjust the torsion acting on wheel assemblies when the motorcycle conversion assembly is operably connected to a motorcycle.

**15 Claims, 9 Drawing Sheets**



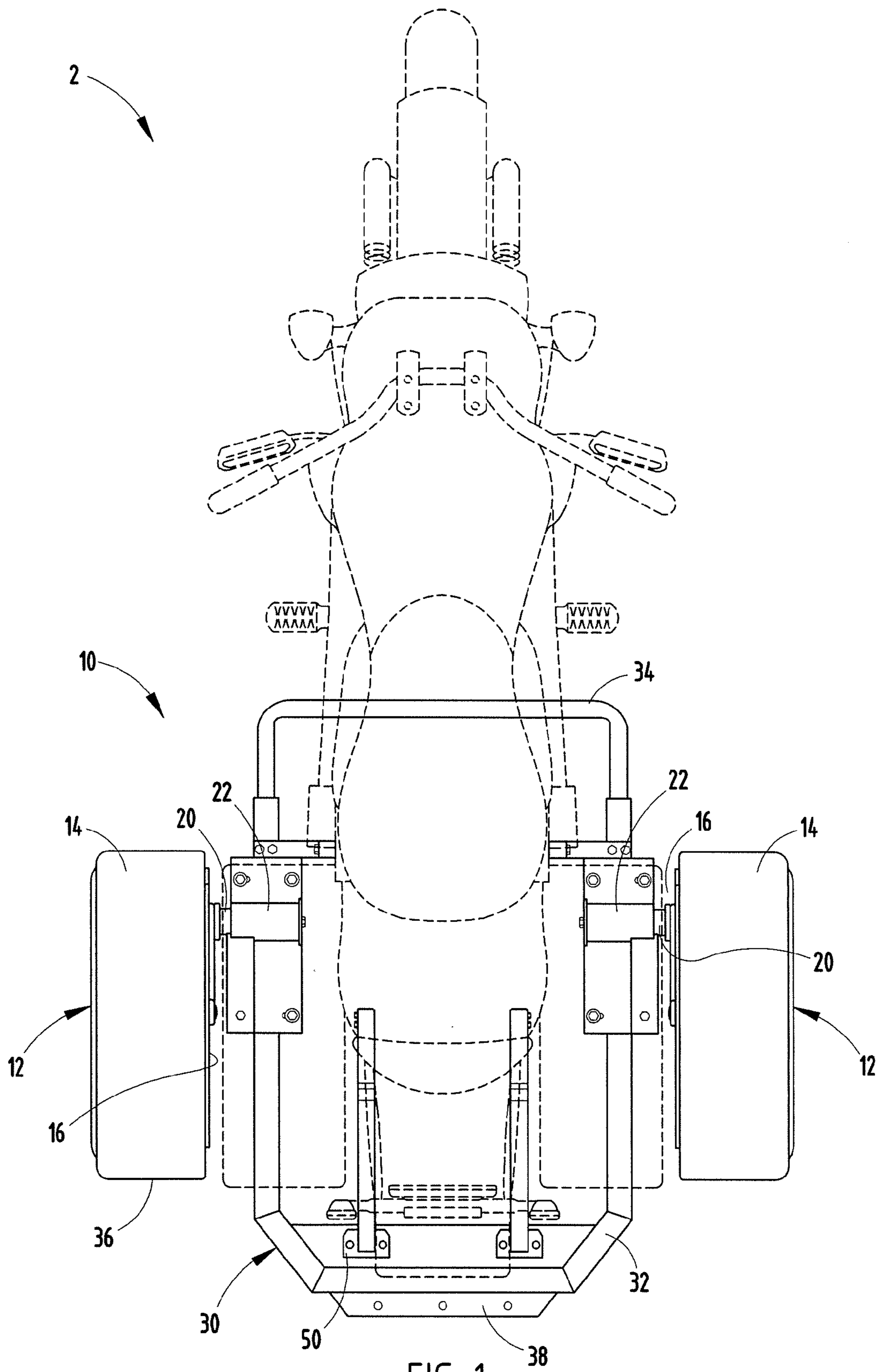


FIG. 1

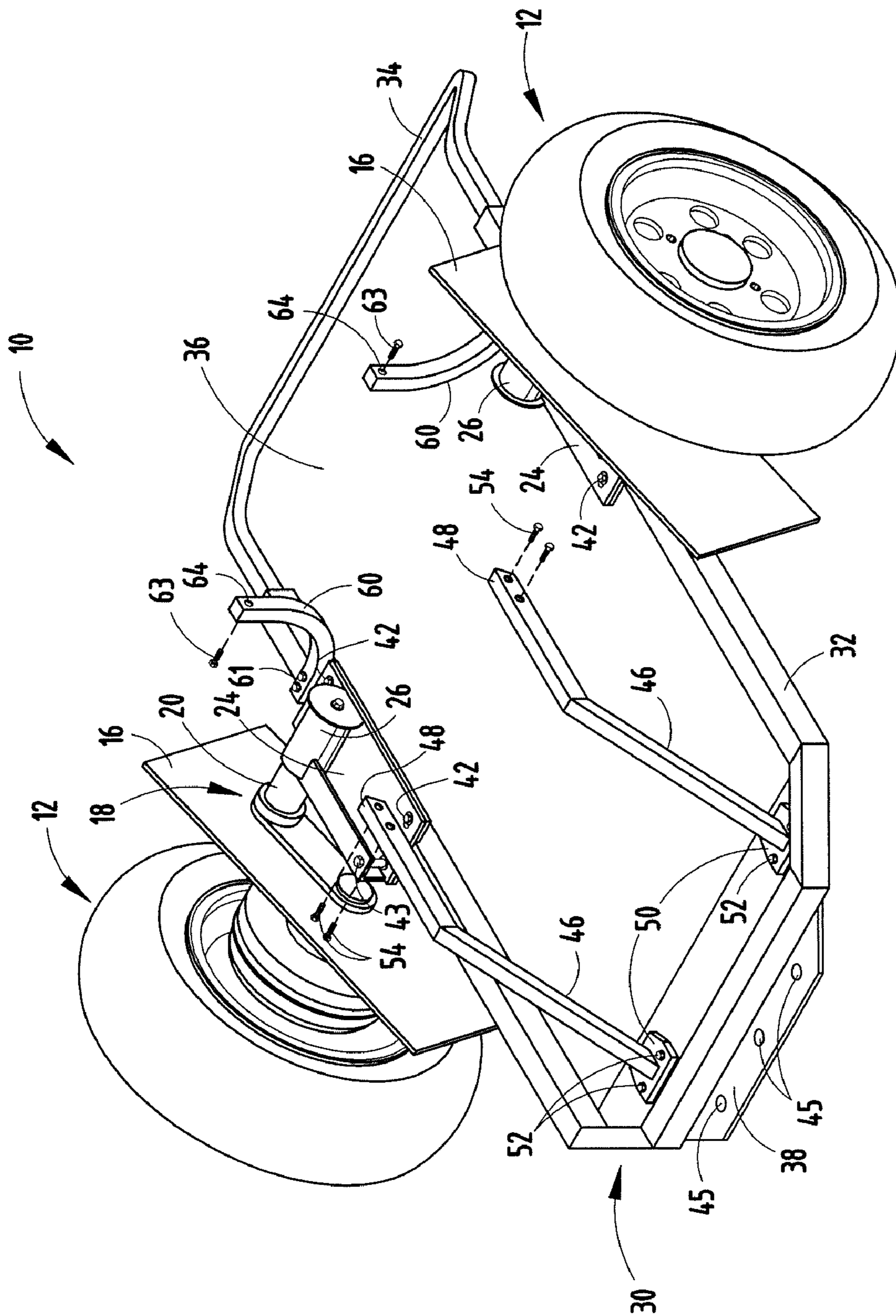


FIG. 2

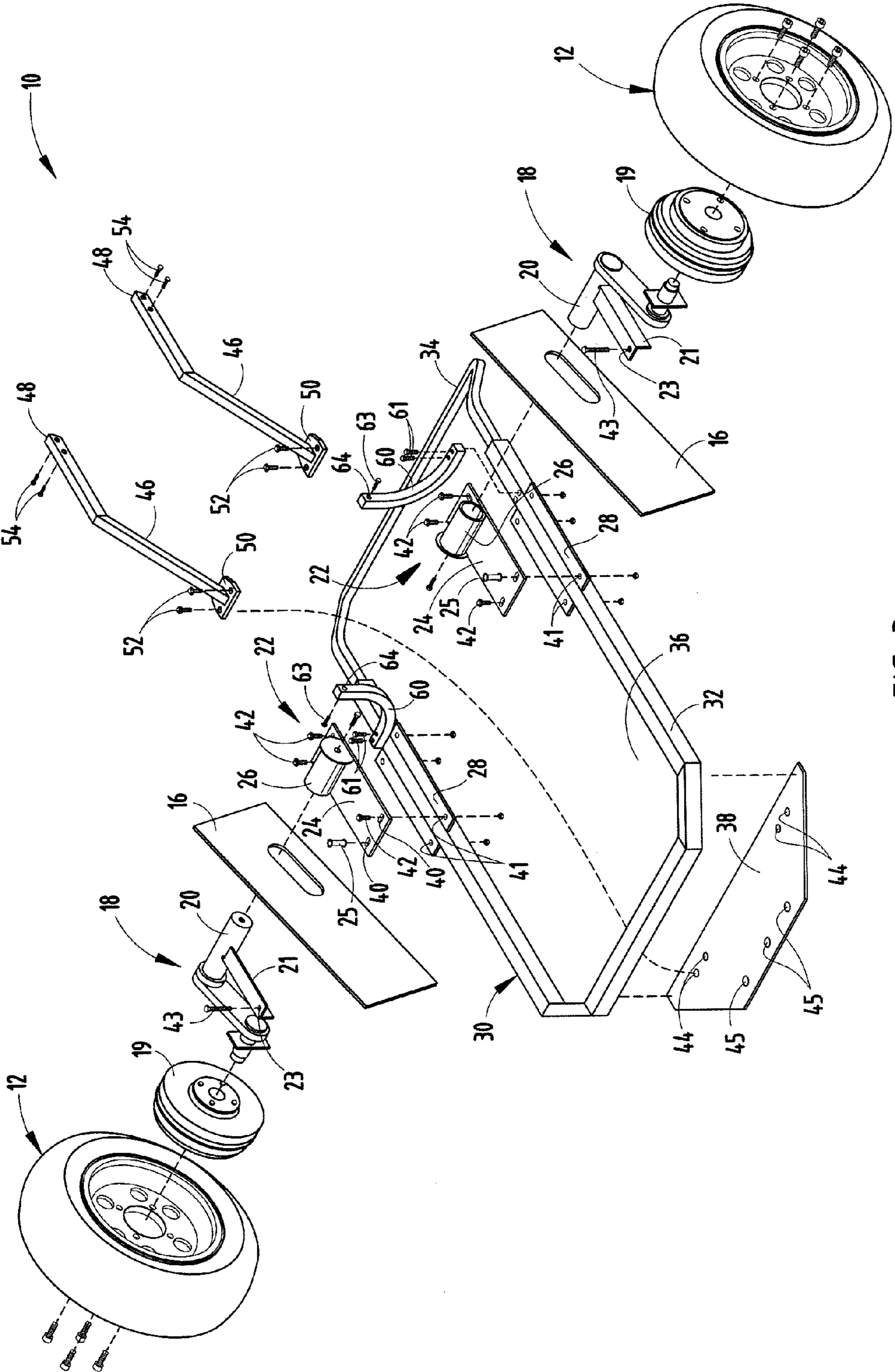


FIG. 3

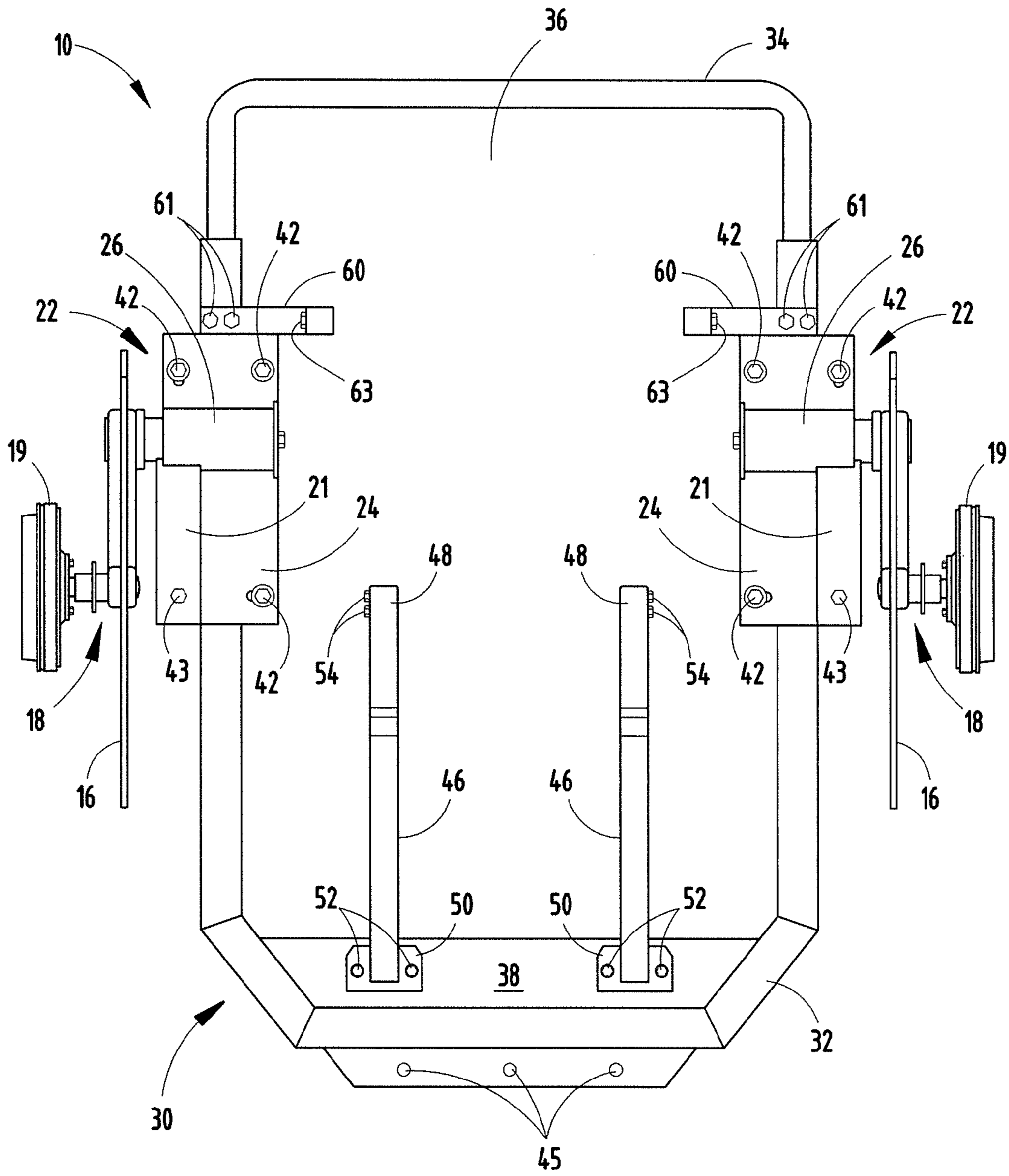


FIG. 4

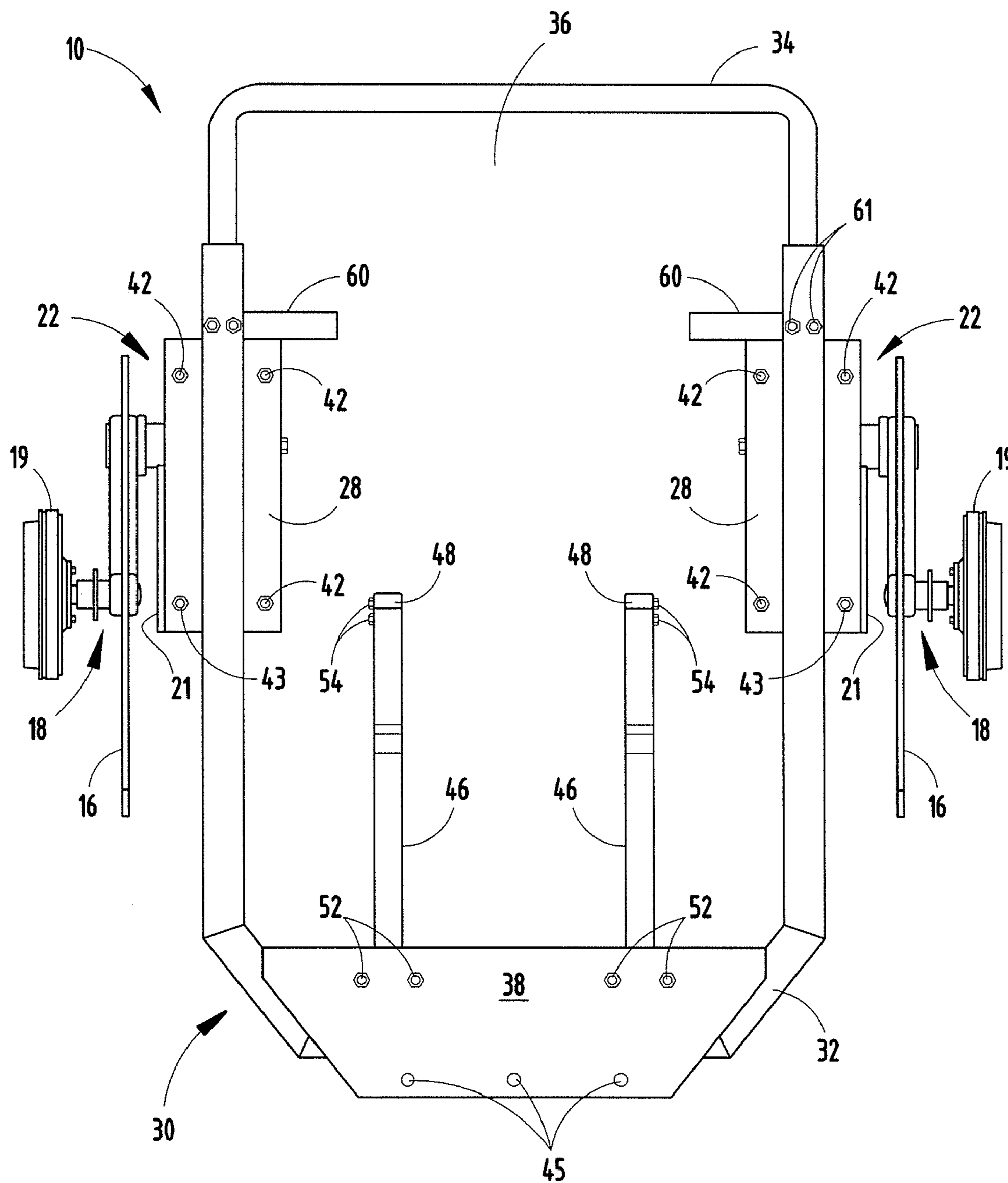


FIG. 5

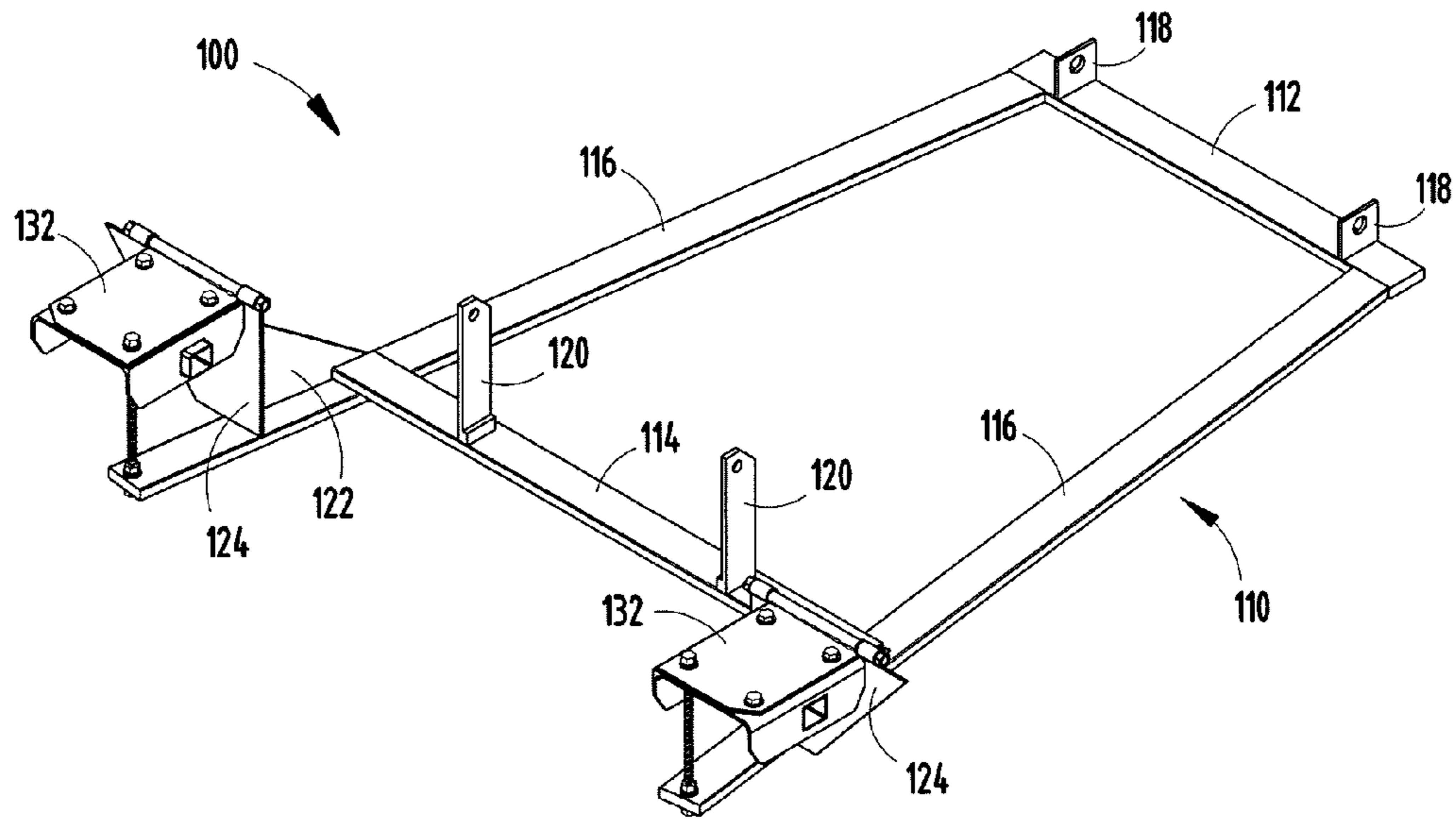


FIG. 6

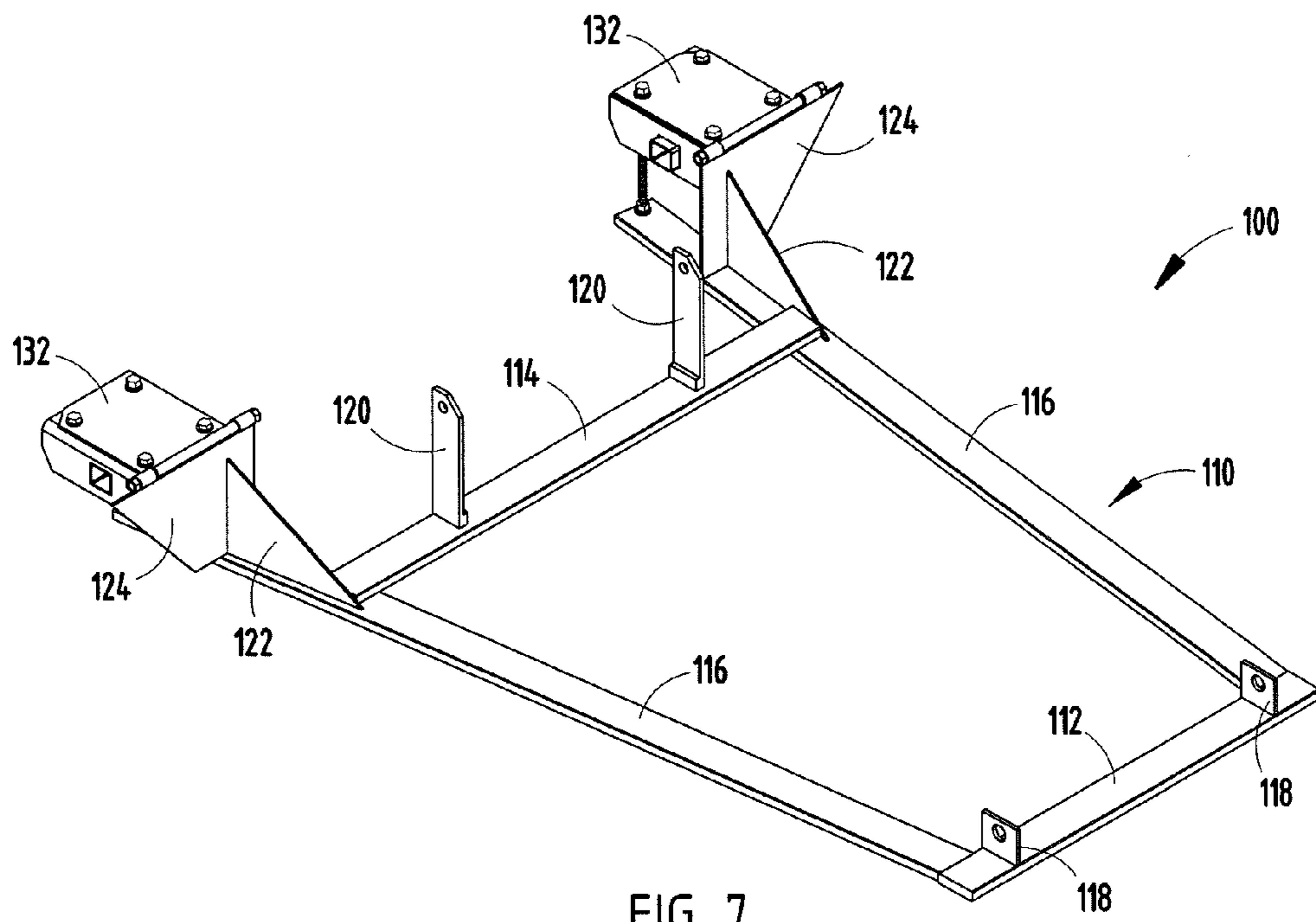


FIG. 7

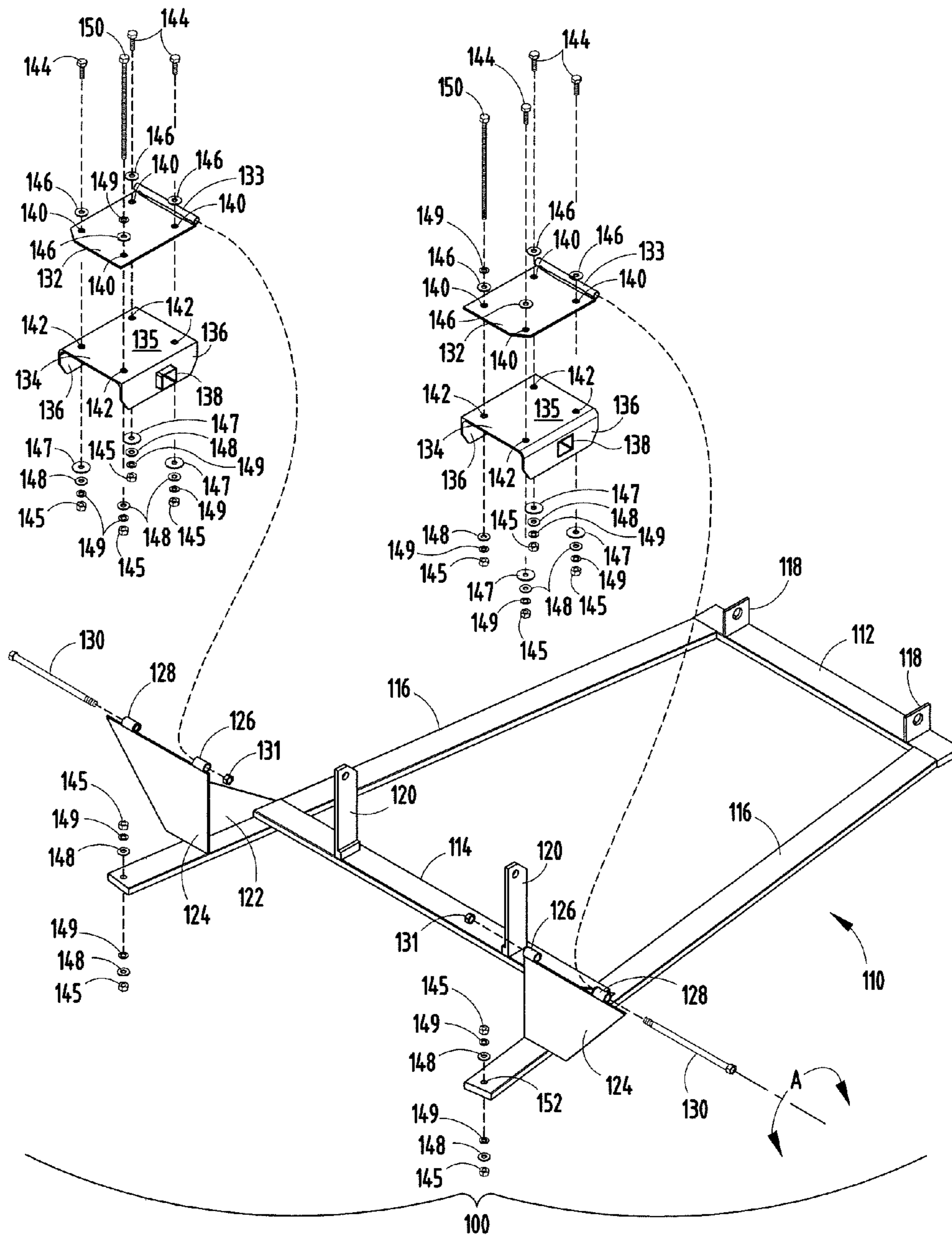
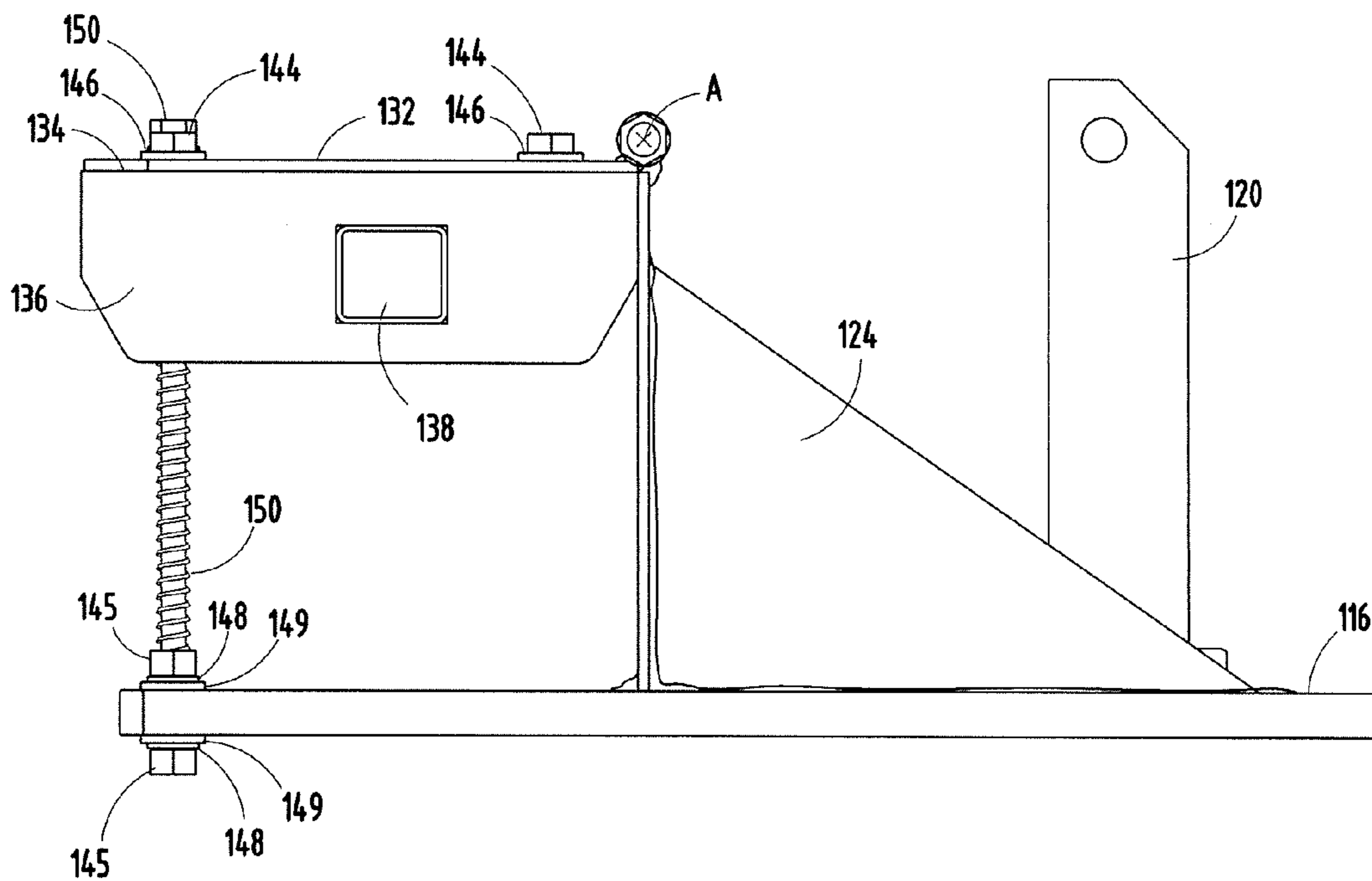
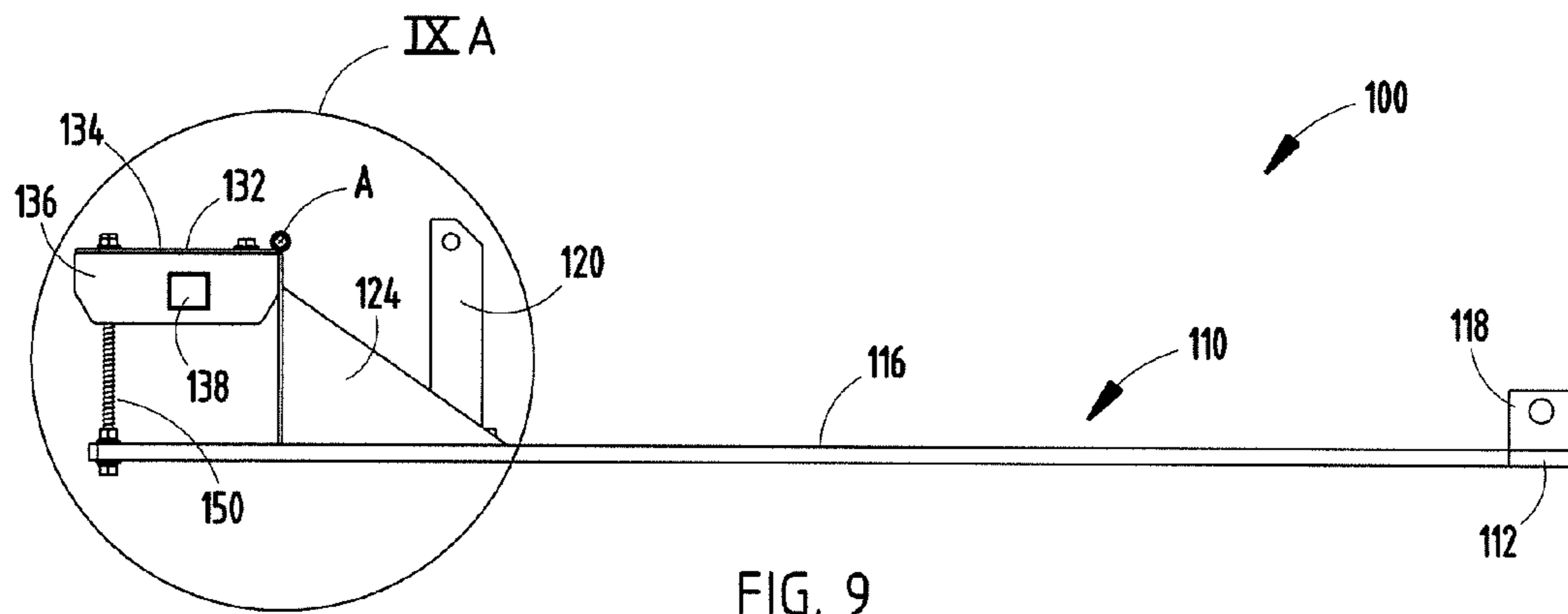


FIG. 8





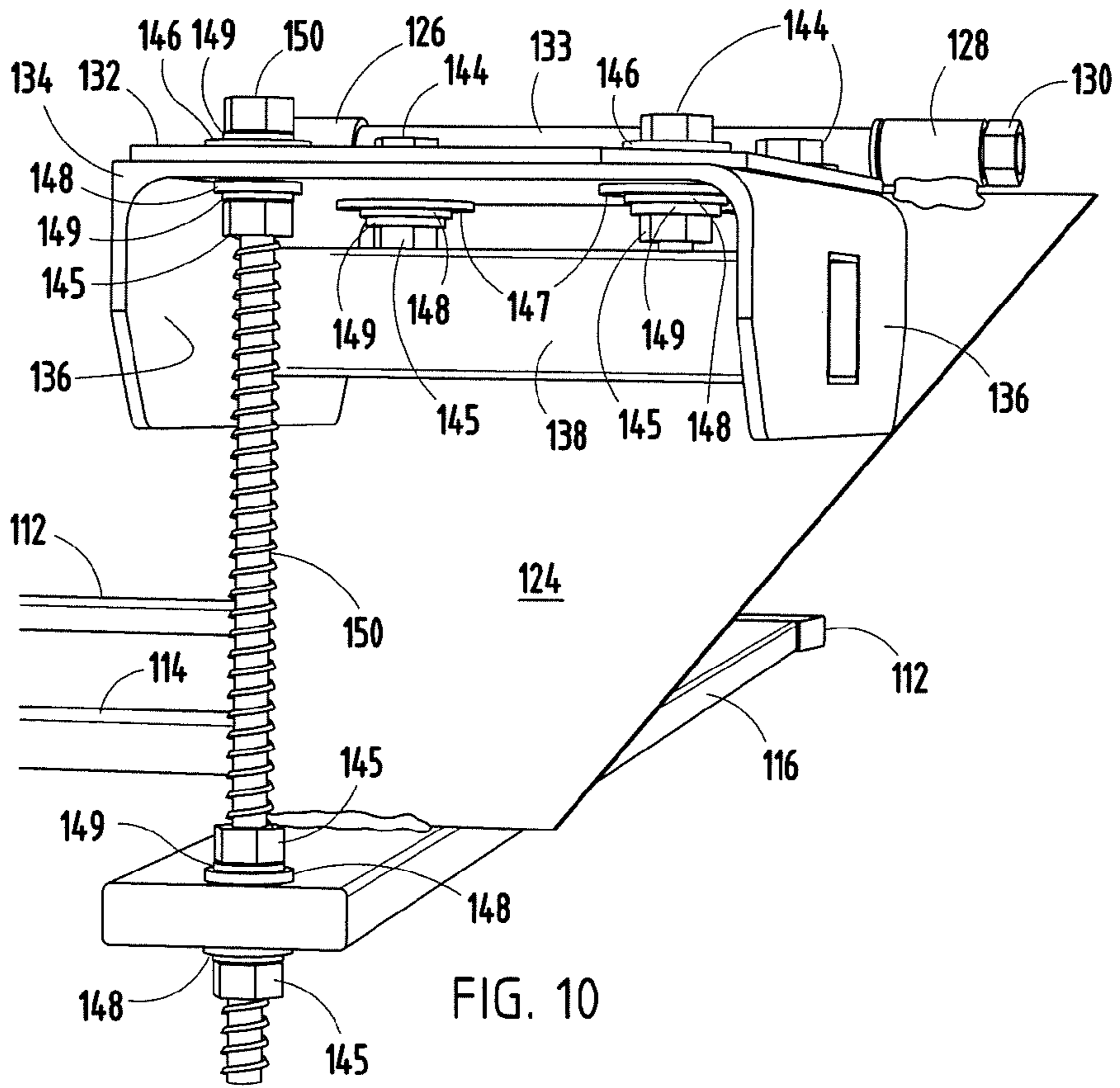


FIG. 10

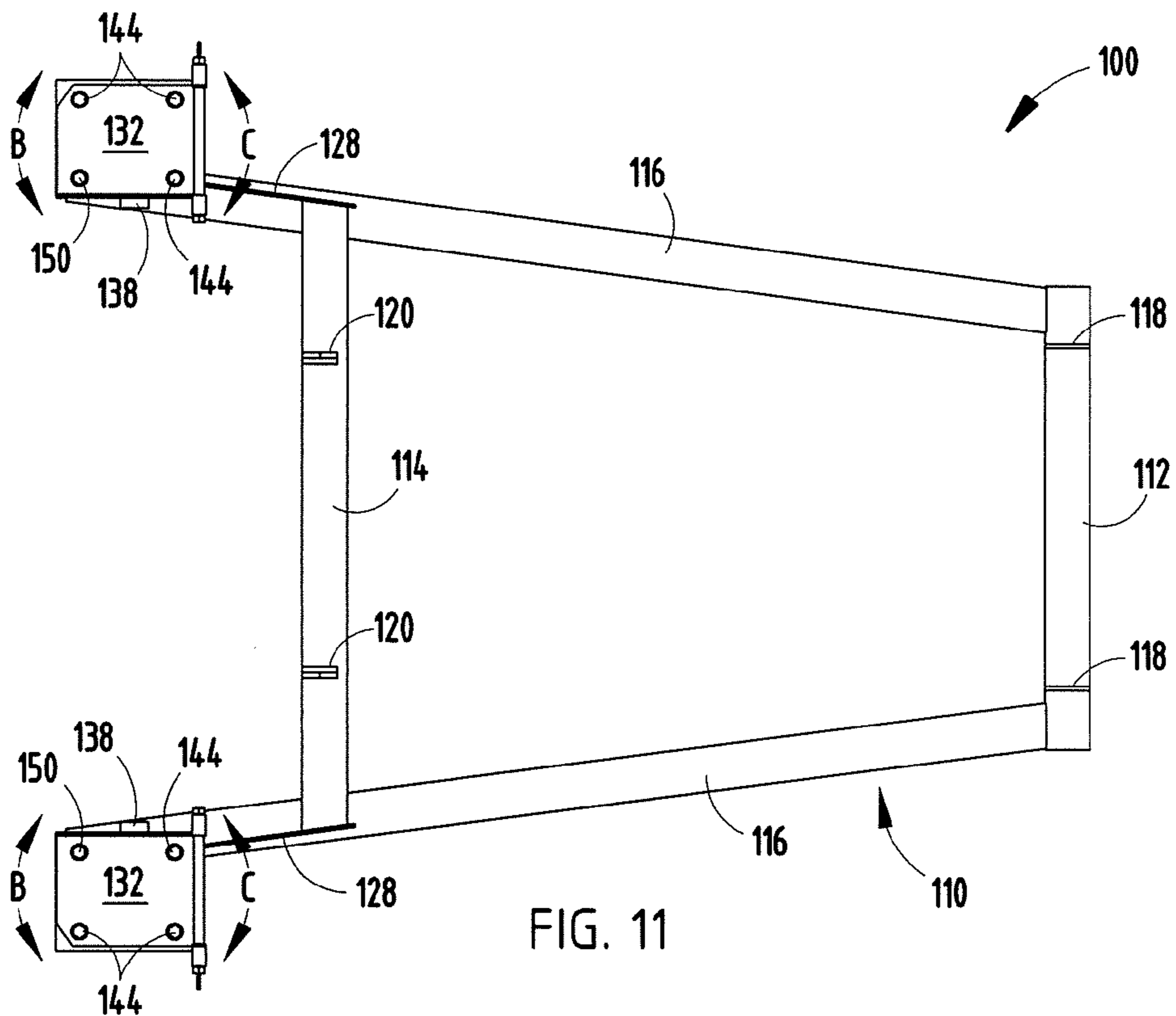


FIG. 11

**1****MOTORCYCLE CONVERSION ASSEMBLY****CROSS-REFERENCE TO RELATED APPLICATIONS**

This application claims priority under 35 U.S.C. §119(e) and the benefit of U.S. Provisional Application No. 61/095,427 entitled MOTORCYCLE CONVERSION ASSEMBLY, filed on Sep. 9, 2008, by Paul Barns. the entire disclosure of which is incorporated herein by reference.

**BACKGROUND OF THE INVENTION**

Generally, motorcycles have become an iconic part of the American culture and serve as a means for individualistic expression for the motorcycle owner. Unfortunately, the nature of the conventional two-wheel motorcycle often does not have the required stability and ease of operation that may be needed for a disabled motorcycle enthusiast or an elderly rider looking to extend his or her time on their motorcycle. In the past, a variety of three-wheel motorcycles and conversion kits have been proposed to help add the stability and ease of operation needed for particular groups of riders. While several variations of the aforementioned theme have been employed in the art, no art known to Applicant discloses a motorcycle conversion assembly that may be readily bolted to an existing unmodified motorcycle which allows for precise adjustment of the wheel assemblies, provides means for hiding the conversion assembly framework, can remain on the motorcycle without the wheel assemblies for use in attachment of different accessories and provides the strength and rigidity needed in the framework to handle high speed transport.

**SUMMARY OF THE INVENTION**

The present invention generally relates to a motorcycle conversion assembly, and more particularly, to a motorcycle conversion assembly that is modular and adjustable for use with an existing unmodified motorcycle. The motorcycle conversion assembly makes it possible to convert a conventional two-wheel motorcycle into a motorcycle having the look and the stability of a tricycle-type vehicle.

These and other features, objects and advantages of the present invention will become apparent upon reading the following description thereof together with reference to the accompanying drawings.

**BRIEF DESCRIPTION OF THE DRAWINGS**

The present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

FIG. 1 is a top plan view of a motorcycle conversion assembly attached to a motorcycle in accordance with one embodiment of the present invention;

FIG. 2 is a perspective view of a motorcycle conversion assembly in accordance with one embodiment of the present invention;

FIG. 3 is an exploded perspective view of a motorcycle conversion assembly in accordance with one embodiment of the present invention;

FIG. 4 is a top elevational view of a motorcycle conversion assembly in accordance with one embodiment of the present invention;

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FIG. 5 is a bottom plan view of a motorcycle conversion assembly in accordance with one embodiment of the present invention;

FIG. 6 is a perspective view of a motorcycle conversion assembly in accordance with another embodiment of the present invention;

FIG. 7 is a perspective view of a motorcycle conversion assembly in accordance with the present invention;

FIG. 8 is an exploded perspective view of a motorcycle conversion assembly in accordance with the present invention;

FIG. 9 is a side elevational view of a motorcycle conversion assembly in accordance with the present invention;

FIG. 9A is a fragmentary side elevational view of a motorcycle conversion assembly in accordance with the present invention;

FIG. 10 is a fragmentary perspective view of a motorcycle conversion assembly in accordance with the present invention; and

FIG. 11 is a top plan view of a motorcycle conversion assembly in accordance with the present invention.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

For purposes of description herein, the terms “upper,” “lower,” “right,” “left,” “rear,” “front,” “vertical,” “horizontal,” and derivatives thereof shall relate to the invention as oriented in FIG. 2. However, it is to be understood that the invention may assume various alternative orientations, except where expressly specified to the contrary. It is also to be understood that the specific devices and processes illustrated in the attached drawings, and described in the following specification are simply exemplary embodiments. Hence, specific dimensions and other physical characteristics relating to the embodiments disclosed herein are not to be construed as limiting, unless expressly state otherwise.

In regards to FIG. 1, a motorcycle conversion assembly is generally shown at reference identifier 10. The conversion assembly 10 is shown attached to a motorcycle 2 in FIG. 1. In one embodiment of the present invention, the conversion assembly 10 includes wheel assemblies 12 disposed in a generally parallel, laterally spaced-apart relationship. The wheel assemblies 12 are covered by fender assemblies 14 which are attached to fender mounting plates 16 which are disposed above torsion axles 18 which are commercially available from Northern Tool and Equipment. As shown in FIG. 3, the wheel assemblies 12 attach to the torsion axles 18 with wheel hubs 19. The torsion axles 18 have cylinder-shaped end pieces 20 which sleeve into adjustable torsion axle mounting assemblies 22, as shown in FIGS. 1 and 3. The torsion axle mounting assemblies 22 comprise axle plates 24 and tube-like portions 26 for accepting the cylinder-shaped ends 20 of the torsion axles 18. The torsion axle mounting assemblies 22 further comprise mating square-shaped frame plates 28 connected with an overall framework 30 of the assembly 10. Thus, the torsion axle mounting assemblies 22 make for independent torsion adjusters in assembly.

As shown in FIG. 3, in one embodiment of the present invention, the axle plates 24 of the torsion axle mounting assemblies 22 have a series of fastener apertures 40 which mate with fastener apertures 41 on the frame plates 28 of the torsion axle mounting assemblies 22. Some of the fastener apertures 40 on axle plates 24 are of an oblong shape which allows for the adjustment of the axle plates 24 relative to the

frame plates **28** of the torsion axle mounting assemblies **22**. Axle plates **24** attach to frame plates **28** via fasteners **42**, as shown in FIG. **3**.

Referring again to FIG. **3**, in another embodiment of the present invention, the torsion axles **18** further include L-shaped flanges **21** disposed off of the cylindrical ends **20** of the torsion axles **18**. Fasteners **43** are used to go through apertures **23** disposed at the end of the L-shaped flanges **21** and then through spacers **25** and through the axle plates **24** of the torsion axle mounting assemblies **22**. Different spacers **25** can be used with the L-shaped flanges **21** to adjust the degree of torsion acting on torsion axles **18**.

As shown in FIGS. **4** and **5**, in one embodiment of the present invention, the framework **30** includes two main components. The first component is a generally U-shaped member **32** with the second component being a U-shaped member **34** which sleeves into U-shaped member **32**, thus providing a rigid framework having first and second side members as well as first and second cross members. In assembly, the U-shaped components **32** and **34** come together to provide a pocket for the rear wheel of an unmodified motorcycle **2** to be inserted. In assembly, the U-shaped member **34** is disposed at the front of the framework **30** with the U-shaped member **32** disposed in the rear. The U-shaped member **32** further comprises a plate **38** which is welded to the frame member **32** which provides support for motorcycle mounting brackets as described in further detail below.

Referring again to FIGS. **2** and **3**, plate **38** is attached to frame member **32** by conventional means such as bolts or welding. Plate **38** further has apertures **44** which are used to receive motorcycle bracket assemblies. Angled bracket assemblies **46** comprise motorcycle mounting points **48** and plates **50** for mounting the angled brackets **46** to frame plate **38**. In assembly, the angled brackets **46** are mounted to frame plate **38** at apertures **44** using fasteners **52**. Once in place on the framework **30**, the angled brackets **46** are then mounted to the motorcycle **2** at points **48** using fasteners **54**. The angled brackets **46** mount to the frame of the motorcycle **2** at point **48** at a location on the motorcycle **2** suited to support motorcycle conversion assembly **10**.

The framework **30** further includes curve-shaped motorcycle bracket assemblies **60** which have apertures and fasteners **61** at the lower ends **62**, as well as apertures and fasteners **63** at the upper ends **64**, for attachment to the motorcycle **2**. The curved brackets **60** attach to the framework **30** at the lower ends **62** and attach to the motorcycle **2** using apertures and fasteners at the upper ends **64** at a suitable point on the motorcycle **2** for supporting the motorcycle conversion assembly **10**. The motorcycle brackets **60** and **46** are attached to the motorcycle **2** using fasteners that are easily removed to release the conversion assembly **10** from the motorcycle **2**.

In another embodiment of the present invention, plate **38** further comprises apertures **45** for attachment of a ball hitch receiver and safety chains for attachment of a trailer (not shown) to the motorcycle conversion assembly **10**.

In yet another embodiment of the present invention, the wheel assemblies **12** can be removed from the motorcycle conversion assembly **10** such that the frame **30** can be used to pull a trailer without the need for the wheel assemblies **12**.

In another embodiment of the present invention, the motorcycle **2** can be outfitted with saddle bags as indicated by dotted lines in FIG. **1** such that the framework **30** is virtually hidden to the viewer.

In yet another embodiment of the present invention, the torsion axles **18** can be adjusted independently from one side to another using the torsion axle bracket assemblies **22** and adjusting the down pressure on torsion axles **18** by adjusting

the size of spacers **25** disposed underneath the L-shaped flanges **21** stemming from the cylinder-like end pieces **20** of the torsion axles **18**. The independent adjustment of the torsion axles provides for a smoother ride when the motorcycle conversion assembly **10** is attached and used on a motorcycle **2**.

The fender assemblies **14** are attached to fender mounting plates **16** which are mounted on torsion axles **18**. In one embodiment of the present invention, the fender assemblies **14** move with the wheel assemblies **12** on the axis of the torsion axle **18** thus adding to the smoother ride and homogeneity of the system in travel.

Referring to FIG. **6**, in yet another embodiment of the present invention, a motorcycle conversion assembly is generally shown by reference identifier **100**. The conversion assembly **100** is generally comprised of a frame **110**, which is made of a front cross member **112**, a rear cross member **114**, and two side members **116**. As shown in FIGS. **6** and **7**, the front cross member **112** further comprises brackets **118** for attaching the front end of the frame **110** to a motorcycle (not shown). The rear cross member **114** of frame **110** further comprises brackets **120** which are used to attach the rear of the frame **110** to a motorcycle in assembly. Plates **122** are attached to the frame **110** at the intersection of side members **116** and rear cross member **114** and further attach to vertical plates **124**.

As shown in FIG. **8**, vertical plates **124** further comprise inner cylinders **126** and outer cylinders **128** disposed at the top front edges of plates **124**. Inner cylinders **126** and outer cylinders **128** are used to house a bolt **130** in assembly. Vertical plates **124** attach to frame plates **132** which further attach to axle plates **134**. The frame plates **132** further comprise cylinders **133** which, in assembly, fit in between inner cylinders **126** and outer cylinders **128** of vertical mounting plates **124**. Thus, in assembly, the vertical mounting plates **124** and frame plates **132** are connected in a pivotal relationship around a pivot point A, which pivots around bolt **130**, which is positioned through outer cylinders **128** of the vertical mounting plates **124**, through cylinders **133** of frame plates **132** and finally through inner cylinders **126** of vertical mounting plates **124** where it is then fixed in place by nut **131**.

As shown in FIG. **8**, the frame plates **132** have four apertures **140**. Axle plates **134** further comprise apertures **142** which align with apertures **140** of frame plates **132** in assembly. Axle plates **134** are U-shaped mounting assemblies having horizontal face plates **135** and vertical downturned portions **136** on either side of the horizontal face plates **135**. Square tubes **138** are disposed between downturned portions **136** of the axle plates **134**, and the square tubes **138** are used to mount torsion axles of the wheel assemblies (not shown). The torsion axles are similar to torsion axles **18**, as shown in FIG. **3**, but, instead of having a cylinder-shaped end piece **20**, the torsion axles have a square-shaped end piece which sleeves into the square-shaped tubes **138**.

Frame plates **132** and axle plates **134** are connected by fasteners **144** which are secured in place by nuts **145**. The fasteners **144** pass through washers **146** before passing through apertures **140** and **142**. The washers **146** are used since apertures **140** are larger than normal apertures which allow for rotational adjustment of the frame plates **132** and axle plates **134** when the motorcycle conversion assembly **100** is fully assembled. Fasteners **144** then pass through the axle plates **134** and then through washers **147** which serve a similar purpose as to washers **146**. Spacers and seals **148** and **149** are also used to hold fasteners **144** in place after final adjustments have been made.

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Torsion adjusters **150** are disposed through frame plates **132** and axle plates **134** and further span the distance between axle plates **134** to the side members **116** on the frame **110** to which they attach. The torsion adjusters **150** use similar spacers and seals as found on fasteners **144**. The torsion adjusters **150** pass through the frame plates **132** and through the axle plates **134** in assembly. Similar nuts, washers, and seals, as described for fasteners **144**, are also used for the torsion adjusters **150** on either side of the torsion adjusters **150** as they pass through apertures **152** of side members **116** of frame **110**. As shown in FIG. **10**, the torsion adjusters **150** can be adjusted by driving the torsion adjusters **150** through the apertures **152** of side members **116** of frame **110** to increase the degree of torsion acting on the torsion axles (not shown). The further the torsion adjusters **150** are driven through apertures **152** of side members **116** of frame member **110**, the higher the degree of torsion acting on the torsion axles. By independently adjusting the torsion adjusters **150**, the frame plates **132**, the axle plates **134**, and the pivot point A rotating about bolts **130**, the end user can customize the ride and feel of the conversion assembly **100**.

As shown in FIGS. **9** and **9A**, the torsion adjuster **150** shown is fully extended. As such, the least amount of torsion would be acting on the torsion axle in this configuration.

As shown in FIG. **10**, the torsion adjuster **150** is partially driven through side member **116** of frame **110**. Thus, the degree of torsion acting on the torsion axle is increased.

As shown in FIG. **11**, the axle plates **134** can be adjusted as indicated by arrows B and C in order to assure the wheel assemblies (not shown) are straight and parallel with the wheel assembly of the motorcycle (not shown). By adjusting the axle plates **134** and by adjusting the torsion adjusters **150** of motorcycle conversion assembly **100**, the user can right any unforeseen inconsistencies with the motorcycle conversion assembly **100** or the motorcycle frame as attached to the motorcycle conversion assembly **100**. The adjustment of the frame plates **132** and axle plates **134** ensures that the wheel assemblies are in the correct position to reduce wear and tear on the wheel assemblies and the torsion axle when in use. The adjustment of the torsion adjusters **150** will insure a smoother custom ride for the end user when the motorcycle conversion assembly **100** is attached and used on a motorcycle. All adjustments to the frame plates **132** and the axle plates **134** can be made independent of each other to insure that each component is properly adjusted with regard to the wheel assembly to which it is attached. The torsion adjusters **150** also operate independently of each other to fine tune each wheel assembly as needed by the end user.

The above description is considered that of the preferred embodiments only. Modifications of the invention will occur to those skilled in the art and to those who make or use the invention. It is understood, therefore, that the embodiments shown in the drawings and described above are merely for illustrative purposes and not intended to limit the scope of the invention, which is defined by the following claims as interpreted according to the principles of patent law, including the Doctrine of Equivalents.

The invention claimed is:

**1.** A motorcycle conversion assembly, comprising:  
 first and second side members disposed in a laterally spaced-apart relationship;  
 first and second cross members operably connected to the first and second side members to thereby define a rigid frame;  
 first and second frame plates operably connected to the frame;

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first and second axle plates operably coupled to and rotatably adjustable with the first and second frame plates;  
 and

first and second torsion adjusting assemblies operably connected to first and second axle plates.

**2.** A motorcycle conversion assembly as set forth in claim **1**, wherein said second cross member is a rear cross member having an accessory plate operably coupled thereto.

**3.** A motorcycle conversion assembly as set forth in claim **2**, wherein said accessory plate further comprises apertures for mounting accessories.

**4.** A motorcycle conversion assembly as set forth in claim **2**, wherein said accessory plate further comprises supports for operably coupling the accessory plate to a motorcycle frame.

**5.** A motorcycle conversion assembly as set forth in claim **1**, wherein said torsion adjusting assemblies comprise a flange and a spacer operably connected to the first and second axle plates.

**6.** A motorcycle conversion assembly as set forth in claim **5**, wherein said torsion adjusting assemblies are adjustable relative to the spacer.

**7.** A motorcycle conversion assembly as set forth in claim **5**, wherein said first and second torsion adjusting assemblies are also operably connected to said first and second frame plates.

**8.** A motorcycle conversion assembly as set forth in claim **1**, wherein said first and second axle plates are rotatably adjusted relative to the first and second mounting plates by loosening one or more fasteners connecting the first and second axle plates to the first and second mounting plates and rotating either the first and second axle plates or the first and second mounting plates relative to each other.

**9.** A motorcycle conversion assembly as set forth in claim **1**, wherein said first and second axle plates are independently adjustable relative to each other.

**10.** A motorcycle conversion assembly as set forth in claim **1**, wherein said first and second torsion adjusting assemblies are independently adjustable relative to each other.

**11.** A motorcycle conversion assembly, comprising:  
 first and second side members disposed in a laterally spaced-apart relationship;

first and second cross members operably connected to the first and second side members to thereby define a rigid frame;

first and second axle plates operably coupled to and rotatably adjustable with the rigid frame; and

first and second torsion adjusting assemblies operably connected to the first and second mounting plates.

**12.** A motorcycle conversion assembly as set forth in claim **11**, wherein said first and second torsion adjusting assemblies are independently adjustable relative to each other.

**13.** A motorcycle conversion assembly as set forth in claim **12**, wherein said torsion adjusting assemblies are also operably connected to a first frame plate and a second frame plate.

**14.** A motorcycle conversion assembly as set forth in claim **13**, wherein said torsion adjusting assemblies comprise mechanical fastener assemblies that can be adjusted to control torsion and is operably coupled to the rigid frame.

**15.** A method of making a motorcycle conversion assembly, comprising:

providing first and second side members;

providing first and second cross members;

operably connecting first and second side members to the first and second cross members to thereby define a rigid frame;

providing first and second frame plates;

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operably connecting first and second frame plates to the frame;  
providing first and second axle plates;  
operably coupling first and second axle plates to the first and second mounting plates in rotatably adjustable relationship; 5

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providing first and second torsion adjusting assemblies; and  
operably connecting first and second torsion adjusting assemblies to the first and second axle plates.

\* \* \* \* \*